

SENIOR REVIEW AND FUNDING RECOMMENDATION
Salton Sea Financial Assistance Program – FY 2012-2013

✓ **Applicant:** Sephton Water Technology, Inc.

Project Title: Salton Seawater Marine Habitat
Pilot Project

✓ **County:** Imperial

✓ **Grant Request:** \$2,003,004

✓ **Total Project Cost:** \$2,812,162

Project Description: Project will develop a process for reclamation of hyper-saline water from the Salton Sea to supply and maintain a ¼ acre shallow marine habitat pond on recently exposed playa. A Vertical Tube Evaporation demonstration plant now under construction will use heat from low pressure geothermal steam to distill Salton Seawater to dilute the habitat pond to a target salinity of 35,000 ppm TDS with no accumulation of selenium or other critical contaminants. Fish and invertebrates currently in the Salton Sea will be introduced to the habitat pond. These can be desert pupfish, or any mix of local fish species. Piscivorous birds including brown and white pelicans already frequent the site and are likely to forage. The Project will construct a ¼ acre Salinity Gradient Solar Pond adjacent to the habitat pond to receive saturated brine derived from the Salton Seawater distillation and habitat pond water recycling. Evaporators and a condenser from an existing desalination pilot plant will be installed at the ponds with a new vacuum flash evaporator to maintain the salinity gradient that will trap heat from the sun to drive a long term on site thermal distillation process. The pond distillation plant will maintain both the shallow marine habitat pond and the salinity gradient solar pond with distilled water make-up. Evaporative losses will be controlled to the extent practicable with a non-toxic molecular monolayer and made-up from Salton Seawater. At least one year of operation will be needed to evaluate the solar energy, water, and salt balance of the operation in all seasons and observe and record wildlife usage of the habitat and any interaction that may or may not occur with the adjacent salinity gradient solar pond.

Summary

Criteria	Score	Factor	Total
1. Consistency with Program goals and objectives	4	7	28
2. Applicant qualifications	5	3	15
3. Project Readiness	3	3	9
4. Feasibility	4	7	28
Total Score			<u>80</u>

Consistency with Program goals and objectives:

This is a research type project that satisfies the objectives of the Financial Assistance Program. The proposed project has three main elements: (1) reclamation of Salton Sea saline water through distillation, (2) salinity gradient solar ponds to generate electricity, and (3) study of pilot scale shallow water habitat with species introduced. The distilled water and salinity gradient solar ponds are expected to provide long term sustainable water supply and required energy for shallow marine habitat at the sea. If the proposed study is

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implemented and successful, an alternative method of providing suitable water supply for shallow water habitat would be possible. The proposal provides a concept of reducing the salinity of the Sea water and use in the habitat ponds. The proposal also includes an element to test monolayer to minimize water evaporation. If the pilot study is successful, additional smaller habitat ponds can be built on the Playa with this technology that would improve air quality and support the habitat in the long term. The proposal discusses limited Operation and Maintenance issues and mentioned that Imperial Irrigation District (IID) will assist with some of the maintenance. Additional discussions related to handling the residuals from the distillation process can be useful. While some similar aspects of the research have already been implemented by others, peer review was not indicated in the proposal.

Applicant qualifications:

The proposed project team seems to have very good experience in the areas required for this project. IID will manage the project and hire expert consultants for design and contractors for construction. The team includes some university researchers who are familiar with the techniques proposed. Some of the team members have developed similar technology in arid climate and other projects at the Sea.

Project Readiness:

This proposed work will be conducted for three and a half years. The schedule requires one year studies of playa before pond construction. The first year is primarily focused on studies, permitting, and documentation. The proposed schedule also has a minimum of one year operation to evaluate solar energy, water quality, salt balance, nutrition, etc. The evaluation, testing, and monitoring (including molecular monolayer products and dosing) may require more time than what was proposed. In addition, the pilot project could not begin construction within 12 months after contract execution. One conceptual figure was included in the package and was difficult to view the text and locations of the ponds.

Feasibility:

The technical information submitted by the applicant supports the feasibility of this project. The budget is detailed and seems to cover all the tasks in the work plan. As a research project, the feasibility of implementing the pilot program is high. However, description of the monitoring and science is not sufficiently detailed. It appears that the applicant intends to develop monitoring methods and protocols during the project phase. This may be reasonable since the pilot is largely experimental. The techniques and costs are included for monitoring. The project team seems to have good experience with the elements of the proposed work. The land required for the proposed ponds is owned by IID and no land purchase is necessary. IID contacted CalEnergy (who holds a long term geothermal lease at the project site) who agreed to supply low steam and cooling water for this project.

The feasibility of using the molecular monolayer products to reduce evaporation has not been tested on larger-scale environments like the Salton Sea with extreme climate, severe winds, and wildlife. It would appear that the local meteorology and the responses of wildlife would be a significant factor governing the project success and any expansion to full-scale. More information is needed as to how the project proponents will

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evaluate any impacts of the monolayers on wildlife health and use. The costs appear to be high for a set of quarter-acre pilot ponds but the implementation of new concepts in challenging environments can be in predictably high.

FUNDING RECOMMENDATION: \$692,819

FAP staff is committed to distributing funding to multiple projects that engage a wide range of stakeholders in restoration and research activities at the Salton Sea. Consequently, the decision was made to allocate the modest \$3m in FAP funding among the three top ranking proposals in a way that would enable meaningful progress for each project.

This proposal demonstrates several important new technologies that will be important to expanding the acreage of habitat ponds around the perimeter of the Salton Sea, especially as ponds are developed farther away from natural sources of fresher water. Habitat ponds cannot be operated with water so salty as to preclude their use by fish, an important food source for migratory fish-eating birds.

We are hopeful that the applicant can leverage this FAP funding to find matching funds from other sources to satisfy the total of this project budget.